

MULTICHANNEL COMMUNICATION SCIENCES, INC.

Ron D. Katznelson, Ph.D.
President

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Ms. Donna R. Searcy
Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington D.C. 20554

Re: Cable Rate Regulation Proceedings
MM Docket No. 92-266

Dear Ms. Searcy:

Enclosed, are the original and nine copies of the Comments filed by **Multichannel Communication Sciences, Inc. ("MCSI")** in the above-referenced proceedings.

Please address any questions concerning this letter to the undersigned.

Sincerely,


Ron D. Katznelson

RDK/pw
Enclosure

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of

Implementation of the Cable Television
Consumer Protection and Competition Act
of 1992

Rate Regulation

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MM Docket No. 92-266

**COMMENTS OF
MULTICHANNEL COMMUNICATION SCIENCES, INC.**

January 27, 1993

Dr. Ron D. Katznelson
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SUMMARY

MCSI believes that many of the issues the Commission is considering in its cable service rate regulation proceedings are intimately related to the Commission's promulgation of rules under other sections of the Cable Act. MCSI submits that in adopting cable rate regulations, the Commission should ensure that undue financial burdens are not imposed on cable operators that implement technological solutions such as addressable broadband descrambling in order to meet their obligations under the Consumer Electronics Equipment Compatibility, the Tier Buy-Through Prohibition, and other sections of the Cable Act, in a manner that minimizes costs to subscribers.

MCSI believes that the Commission should distinguish between separate general categories of cable service. A separate category for Simultaneously Clear Addressable Video Programming Services (defined in Section 2 herein) should be established so as to account for its differing characteristics as compared to services requiring set top decoders. We believe that a separate benchmark should be established for cable systems offering Simultaneously Clear Addressable Video Programming Service in order to reflect their higher value to the subscriber as shown below and in order to facilitate the imperatives of other sections of the Cable Act as enumerated below. The technology difference characterizing the provision of Simultaneously Clear Addressable Video Programming Services and the financial ramifications for cable systems that offer them should be one of the critical factors used by the Commission in establishing rate benchmarks.

MCSI is proposing herein a specific framework for establishing a numerical figure for rate benchmarks applied for the separate category of Simultaneously Clear Addressable Video Programming Services.

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Rate Regulation)	

COMMENTS OF
MULTICHANNEL COMMUNICATION SCIENCES, INC.

1 INTRODUCTION

Multichannel Communication Sciences, Inc. ("MCSI"), hereby submits these comments in response to the Federal Communications Commission's ("Commission") Notice of Proposed Rule Making ("NPRM") in the above-captioned proceeding.

MCSI has a strong interest in the Commission's implementation of the new cable law because of its substantial involvement in the cable industry. MCSI is the developer of the addressable broadband descrambling and access control technology that will allow cable operators to eliminate incompatibilities between consumer electronics equipment and cable systems utilizing scrambled TV transmissions. Using advanced digital signal processing methods embodied in broadband "converter-less" subscriber devices, MCSI's technology restores all features and functions contained in TV receivers and video cassette recorders ("VCRs") by providing the subscribers all authorized channels simultaneously in the clear on their cable drop. (See Exhibit A).

The instant NPRM describes and proposes alternative procedural and substantive cable rate regulations to implement the provisions of Section 3 of the Cable Television Consumer

Protection and Competition Act of 1992 ("Cable Act")¹. Recognizing that coordination of its multiple rulemakings implementing the various provisions of the Cable Act is necessary and is in the public interest, the Commission has solicited comment on how the rate regulation proposals presented in the NPRM would affect, and be affected by, other parts of the Cable Act of 1992 addressed in separate Commission proceedings². While sympathetic to the statutory deadlines the Commission faces in implementing the various provisions of the Cable Act, MCSI is concerned about the level of coordination to be applied by the Commission in addressing separate rulemakings required by the Cable Act. For example, MCSI believes that many of the issues the Commission is considering in its cable service rate regulation proceedings are intimately related to the Commission's promulgation of rules under other sections of the Cable Act. In particular, MCSI submits that in adopting cable rate regulations the Commission should ensure that undue financial burdens are not imposed on cable operators that implement technological solutions such as addressable broadband descrambling in order to meet their obligations under the Consumer Electronics Equipment Compatibility³, the Tier Buy-Through Prohibition, and other sections of the Cable Act, in a manner that minimizes costs to subscribers.

2 DEFINITIONS

By way of background, the following terms are relevant to MCSI's technology and are used herein in connection with MCSI's discussion of its specific concerns in this proceedings:

- (a) **Addressable Broadband Descrambler** means a device installed at a subscriber location (either off premises, at a point of entry, or indoors) which can be controlled from the

1. Pub. L. No. 102-385, 102 Stat. 1460 (1992).

2. See NPRM at para. 2.

3. As the developer of advanced broadband descrambling technology, MCSI has a major interest in cable-consumer electronics compatibility issues. Currently MCSI is participating in the EIA/NCTA joint meetings relating to the compatibility provisions of the Cable Act. Accordingly, MCSI expects to play an active role in the related proceedings the Commission initiated on January 14, 1993.

cable headend to simultaneously descramble and provide in the clear all cable television services which the subscriber purchased.

- (b) **Addressable Broadband Denial** means the capability within a device installed at a subscriber location (either off premises or at a point of entry) which can be controlled from the cable headend to deny selected channels (otherwise transmitted in the clear on the cable system) from being received by subscribers who did not purchase the services on these channels. Such denial may be effected at the subscriber location by channel specific local scrambling or jamming (interdiction), or by dedicated addressable traps.
- (c) **Simultaneously Clear Addressable Video Programming Services** means Video Programming Services in which all video channels carrying services that the subscriber purchased are simultaneously available to the subscriber in the clear on an addressable basis. That is, in a manner that allows direct connections to TV sets and VCRs without a decoder or descrambler, thereby allowing the subscriber to use all the features and functions that were purchased with his/her consumer electronics equipment. The addressable nature of these services should allow service tier unbundling. The term Video Programming Services means any video programming regardless of service tier including, as defined by the Cable Act, the Basic Service Tier, Cable Programming Services ("Expanded basic" or "Standard" tiers) and video programming offered on a per channel ("Pay") or per program basis ("Pay-Per-View"). Simultaneously Clear Addressable Video Programming Services may be provided by cable operators who employ addressable broadband descrambling and/or denial, addressable interdiction or addressable traps.

The terms defined above are used in conjunction with MCSI's central argument presented below.

3 THE COMMISSION MUST ESTABLISH HIGHER THAN AVERAGE BENCHMARKS FOR "SIMULTANEOUSLY CLEAR ADDRESSABLE VIDEO PROGRAMMING SERVICES".

To fulfill the requirements of the Cable Act to establish regulations governing rates of the Basic Service Tier and of Cable Programming Services, the Commission tentatively

concludes in its NPRM that it shall set up criteria or benchmarks for cable service rates based on various factors.⁴ The factors most relevant to our concern are: Rates for similarly situated systems taking into account similarities in costs and other relevant factors; Rates of systems subject to effective competition; The systems' rates as a whole for all cable services; and Capital operating costs of the system. The NPRM describes a benchmark rate as a price against which a given cable system's Basic Service Tier rate or Cable Programming Service rate would be compared. The benchmark would permit identification of systems with presumptively unreasonable rates, while establishing a zone of reasonableness for systems with rates below the benchmark.

MCSI believes that in establishing such benchmarks, the Commission should distinguish between separate general categories of cable service. A separate category for Simultaneously Clear Addressable Video Programming Services should be established so as to account for its differing characteristics as compared to services requiring set top decoders. We believe that a separate benchmark should be established for cable systems offering such services in order to reflect their higher value to the subscriber as shown below and in order to facilitate the imperatives of other sections of the Cable Act as enumerated below. The technology difference characterizing the provision of Simultaneously Clear Addressable Video Programming Services and the financial ramifications for cable systems that offer them should be one of the critical factors used by the Commission in establishing rate benchmarks. We address this topic in the following sections.

3.1 Simultaneously Clear Addressable Video Programming Services are not "like" Video Programming Services with decoder devices.

Assuming an identical programming offering of video services provided over two separate cable systems that differ only in the manner in which these video services are provided, the subscriber will experience a marked difference between service requiring a set-top decoder and that offered by Simultaneously Clear Addressable Services. This result is because unlike services

4. See NPRM at paras. 30,34,90,91.

provided through a "one channel at-a-time" decoder/converter, the subscriber receiving Simultaneously Clear Addressable Services can utilize the consumer electronics equipment features and functions that are otherwise rendered useless by the decoder. Furthermore, only the subscribers on cable systems that provide Simultaneously Clear Addressable Services can:

- (a) watch a program on one channel while simultaneously using a video cassette recorder to tape a program on another channel;
- (b) use a video cassette recorder to tape two consecutive programs that appear on different channels; and
- (c) use advanced television picture generation and display features such as Picture-In-Picture.

In establishing rate criteria or benchmarks for such video programming services, the Commission is compelled to find that these two types of services are not "like" services, and therefore should, in principle, command benchmark rate differentials reflecting at least the perceived value to the subscriber⁵. There is no doubt that the very need Congress saw in enacting Section 17 of the Cable Act dealing with the consumer electronics equipment compatibility problem (which the provision of Simultaneously Clear Addressable Services solves fully), is the most compelling evidence that the services compared above are not "like" services.

5. These two types of services are amenable to a comparative analysis. Where the Commission needed to develop tests for comparing two types of services in other regulatory areas, the Commission developed appropriate methods. For example, the Commission developed the "functional equivalency" test principles in conjunction with Section 202(a) of the Communications Act, 47 U.S.C. § 202(a). In determining whether two services are "like" under this test, the Commission focuses "on whether one service differs -- either as an objective technical matter, or in terms of customer perception -- in any material functional respect from another." AT&T Communications, 67 R.R. 2d 399, 403 (1990). In this regard, it was made clear that transmission technology and use of some of the same network or facilities for providing the service is for the most part irrelevant. Ad Hoc Telecommunications Users Comm. v. F.C.C., 680 F.2d 790, 795-796 (D.C. Cir. 1982). Should the Commission develop similar tests in this cable rate regulatory area, it will become clear that in the instant comparison above, Simultaneously Clear Addressable Services differ from those offered through set-top decoders by the objective technical matter of being provided simultaneously in the clear and therefore differ in terms of customer perception, by providing the extra utility of consumer electronics equipment compatibility as described above.

To the extent the Commission intends to adopt Cost-of-Service rate criteria as an additional factor, the benchmark differences may also reflect any differences in cable operator's Simultaneously Clear Addressable equipment installation costs and other cost factors.

We submit that the public interest would be served by establishing separate rate benchmarks for this class of services and that it is critical that the Commission address this technology difference in crafting the rate benchmarks so that full achievement of the underlying purposes of the Cable Act's provisions enumerated below are not thwarted by onerous and inappropriate financial constraints on cable operators.

3.2 The provision of Simultaneously Clear Addressable Video Programming Services is responsive to the Cable Act.

3.2.1 Consumer Electronics Equipment Compatibility [Section 17]

In Section 17 of the Cable Act Congress directs the Commission to work with the consumer electronics industry and the cable industry to find "means of assuring compatibility between televisions and video cassette recorders and cable systems, consistent with the need to prevent theft of cable service, so that cable subscribers will be able to enjoy the full benefit of both the programming available on cable systems and the functions available on their televisions and video cassette recorders". § 624(A)(b)(1). (emphasis supplied). Although further detailed analysis of Section 17 of the Cable Act is beyond the scope of the instant proceeding, suffice it to recognize that in general, the burden of assuring the compatibility must be carried by both the consumer electronics manufacturers as well as the cable operators. Unfortunately, the relief Congress intended for cable subscribers using the existing installed base of some 200 million TV sets and 80 million VCRs, can only come in significant ways from cable operators' actions and capital investments in technological solutions which address the compatibility problem.

Cable operators are entitled to a fair return on such capital investments. With respect to this installed base of consumer electronics equipment used by cable subscribers, the Commission is left with very little choice in fully discharging its obligations under Section 17 of the Cable Act but to use the rate regulation tools afforded to it by Congress to provide

incentives to cable operators that adopt cost effective technological solutions to the compatibility problem. The Commission must recognize that a cable operator providing Cable Programming Services, Basic Tier Services and Pay or Pay-Per-View Services within Simultaneously Clear Addressable Video Programming Services will most assuredly comply with the commands of Section 17 of the Cable Act. This is because all channels so provided to the subscriber are simultaneously in the clear, and therefore such cable service provides full compatibility with all "cable ready" consumer electronics equipment and their features and functions used by the subscriber.

As can be appreciated from the detail in Appendix A, as a special case of technologies that may assure such compatibility, MCSI's broadband access control technology will not only allow the simultaneous descrambling of the authorized Pay or Pay-Per-View tiers, but also allow a cable operator to provide Simultaneously Clear Cable Programming Services (Expanded Basic) in tiers situated above the Basic Service tier without having to employ scrambling on Expanded Basic channels at the head-end, which scrambling otherwise requires the majority of the cable system's subscribers to be equipped with an addressable decoder. As shown in the example of Figure 3 of Appendix A, this Expanded Basic tier access control is done by using the addressable local denial feature of the broadband descrambler on channels comprising the tier that the subscriber did not purchase. Because only a small minority of subscribers do not subscribe to such expanded basic tiers, installation of such broadband access control hardware will initially only be required for the subscriber set consisting of "Basic Only" subscribers and those subscribing to channels or tiers that are already provided in scrambled form on the system.

3.2.2 Tier Buy-Through Prohibition [Section 3(a)]

MCSI agrees with the Commission's conclusion in the Tier Buy-Through Prohibition proceedings stating that the goal of the Cable Act's buy-through prohibition is to foster the ability of subscribers to choose freely among available programming services.⁶ The Senate

6. See Implementation of Section 3 of the Cable Television Consumer Protection and Competition Act of 1992 -- Tier Buy-Through Prohibition, MM Docket No. 92-262, Notice of Proposed Rule Making, FCC-92-540 (released Dec. 11, 1992), Para. 3.

Committee Report states that "[t]hrough unbundling, subscribers have greater assurance that they are choosing only those program services they wish to see and are not paying for programs they do not desire." S. Rep. No. 102-92, 102d Cong., 2d. Sess. (1992) at 77. The Cable Act's goal of accomplishing the technical capability within cable systems to offer virtually unbundled programming services within 10 years⁷ means that Congress intended for cable operators to invest incrementally in addressable technology (and thus inevitably pass associated incremental costs to subscribers) in order to arrive at full addressability. Hence, to the extent that Simultaneously Clear Video Programming Services meeting Section 17 requirements are supplied via rigidly installed band traps that do not permit full unbundling, the provision of such programming services supplied by such non addressable technology may frustrate the Tier Buy-Through Prohibition provisions of Section 3(a) of the Cable Act. Therefore, such service provision may not be entitled to higher (incentive based) rate benchmarks discussed below as would Simultaneously Clear Addressable Video Programming Services.

3.2.3 Other Provisions of the Cable Act [Sections 4-6, 10(b),15]

There are additional provisions of the Cable Act that can be better implemented using the addressable technologies used in supplying Simultaneously Clear Addressable Video Programming Services. These are related to added flexibility in accommodating the various channel carriage requirements of Sections 4,5,6 as well as the ability to provide for blockage of Indecent Programming on Leased Access Channels (Section 10(b)) and Premium Channel Previews (Section 15).

3.3 Rate benchmarks that ignore Simultaneously Clear Addressable Video Programming Service offering will discourage cable operators and equipment suppliers from investing in technologies that are responsive to subscribers' and Congress' demands.

As explained above, the offering of Simultaneously Clear Addressable Video Programming Services meets a significant number of statutory requirements of the Cable Act while providing significant improvement in subscriber satisfaction as compared with services

7. §543(b)(8)(B)

provided through the use of set-top decoders. In providing services under the set-top decoder regime, cable operators derive revenues from renting remote control devices and additional set-top decoders for additional outlets within the subscriber home⁸. Cable operators that provide Simultaneously Clear Addressable Video Programming Services allow their subscribers to use their own remote control devices with their consumer electronics equipment that may interface directly with the cable drop. Clearly, the remote control revenues these operators derive are virtually eliminated. Furthermore, when supplying Simultaneously Clear Video Programming Services, no decoder devices are required and thus operators may choose to provide the signal to all cable outlets in the subscriber home without additional indoor equipment. This "whole house" service has recently been initiated by several operators.⁹ However, this type of service requires the operator to abandon second outlet revenues.

The Commission must recognize the tension that exists between the goal of Section 17 of the Cable Act in fostering circumstances that are likely to eliminate or reduce cable operators' existing remote control and additional outlet revenue streams, and the goal of encouraging cable operators to make investments in technologies that adequately address the provisions of the Cable Act listed above. If the Commission's regulations do not reflect higher rate benchmarks for Simultaneously Clear Addressable Video Programming Services as compared to services with set-top decoder devices, cable operators and equipment suppliers will be discouraged from investing and developing technologies that customers want and Congress called for. Under this rate regulation scenario, Cable operators that invested in technologies that provide Simultaneously Clear Addressable Video Programming Services will be precluded from additional revenues other operators who use decoder technologies will continue to enjoy.

8. Industry estimates peg the annual revenues on these items at approximately \$600 million. See Multichannel News, "\$600M in Revenue at Stake on 'Compatibility'" by Gary Kim, October 19, 1992 at 30.

9. See "Going Whole House" by Matt Stump, Cable World, April 27, 1992. at 1. See also "Chambers Gets Friendly with Cable-Ready Gear" by Barnett Parker, Cable World, August 28, 1989. at 20.

The Commission must ensure that there are reasonable financial incentives for cable operators that deploy technologies described above and therefore its regulations must incorporate some of these incentives and be coordinated with the policies sought to be achieved by other sections of the Cable Act and in particular by Section 17.

3.4 A proposed framework for Rate Benchmarks for Simultaneously Clear Addressable Video Programming Services.

MCSI proposes a framework that the Commission could apply to establish the incremental service rate value above the average benchmarks. The framework is applied to the proposed benchmarks for the class of cable services provided as Simultaneously Clear Addressable Video Programming Services.

The Commission would presumably obtain national statistics on service characteristics of cable systems including rates charged for various programming services and rates charged for equipment installation and rental. The Commission acknowledges that in regulating charges for Cable Programming Services (Expanded Basic) it must also include the charges for equipment used to provide such services.¹⁰ Therefore, beyond the programming tier charges, it will most probably obtain the following additional information:

- (1) The average fraction of subscribers renting a remote control.
- (2) The Average monthly revenue for remote control supplied by the cable operator.
- (3) The average fraction of additional outlets in use
- (4) The average charge for additional outlet.

MCSI proposes that a reasonable principle in determining the rate benchmark increments assigned to Simultaneously Clear Addressable Video Programming Services above those of services offered through decoders is the quantity obtained in terms of the numbered items above as $(1)*(2)+(3)*(4)$. That is, that cable operators employing technologies offering Simultaneously Clear Addressable Video Programming Services should be allowed to charge every subscriber receiving such services an increment equal to the average revenues per subscriber that they

10. See NPRM at footnote 94.

would otherwise collect if they were using set-top decoder devices. Of course, an equitable method of apportioning these incremental rate benchmarks between the Basic service tier, Expanded Basic tiers and the Pay/PPV tiers must be devised.

MCSI also recognizes that other factors must be considered in adopting the principles in the proposed benchmark increments. Such factors relate to the fact that some subscribers served by Simultaneously Clear Addressable Video Programming Services may still wish to rent a converter and a remote control for connection to their television sets that do not tune all cable channels, etc.

We anticipate that over time, rate benchmarks so constructed will be replaced by actual surveys of systems offering Simultaneously Clear Addressable Video Programming Services in the face of effective competition from other multichannel video programming suppliers. At that point, it is reasonable to expect that the true incremental market value of such service offering will be evident. This is because a cable operator offering Simultaneously Clear Addressable Video Programming Services would presumably be able to enjoy a premium over a competitive video programming provider, such as a DBS operator, that may have no choice but to use set-top decoders in providing his services¹¹.

3.5 The Commission has the duty and authority to establish a higher rate benchmark for Simultaneously Clear Addressable Video Programming Services.

The rate benchmark differentiation factors MCSI focuses on in these comments have not been directly mentioned or considered by the Commission in the NPRM. However, MCSI believes that upon further consideration of these comments and other comments in this proceeding and in view of the legislative history and Congress' intent, the Commission will

11. In this regard it is instructive to note that DirecTV, a future DBS operator, already recognizes the need to offer subscribers the ability to receive two channels simultaneously, and prepares optional special dual decoders for that purpose with a price tag increment of \$200 above a single channel decoder. (See Satellite Business News supplement, January 14, 1993). Although this dual decoder device does not provide full compatibility with consumer electronics equipment as Simultaneously Clear Addressable cable service would, this clearly demonstrates that some subscribers must be willing to value such feature at \$200.

recognize the opportunity to use judiciously the rate regulation instrument in crafting fair and equitable rate benchmarks that provide proper incentives to cable operators to deploy technologies that serve the public interest. MCSI believes that incentive based rate regulations are not foreign to the Commission and that there is a substantial record of their success¹².

The Cable Act directs the Commission by statute to consider six factors in regulating Cable Programming Services¹³. It further affords the Commission the authority to consider other factors. In Paragraph 91 of the NPRM, the Commission inquires whether it should give the statutory factors enumerated in the Cable Act primary or greater weight than others. MCSI submits that the Commission has the duty and authority to give the considerations contained in these Comments no lesser weight than that given to the enumerated statutory factors. This is because the factors raised in these Comments are direct derivatives of other statutory provisions of the Cable Act and should thus command no lesser force. Furthermore, MCSI's specific proposal for establishing separate benchmark categories for certain types of Cable service is consistent with the statutory factors in this section, providing a separate category within which to consider the enumerated factors.

4 CONCLUSION

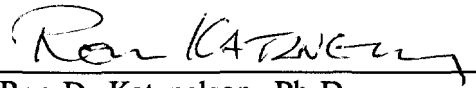
12. See NPRM at footnote 64.

13. §623(c)(1)(A)

In conclusion, MCSI urges the Commission to establish a separate category of cable systems (or cable service) which provide Simultaneously Clear Addressable Video Programming Services and to adopt higher cable service rate benchmarks for that service category in order to serve the public interest and comply with the Cable Act of 1992 as detailed and explained in these Comments.

Respectfully submitted,

MULTICHANNEL COMMUNICATION
SCIENCES, INC.

By: 
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January 27, 1993

APPENDIX A

A NEW DESCRAMBLING TECHNOLOGY PROVIDING CATV SUBSCRIBERS WITH SIMULTANEOUSLY CLEAR MULTICHANNEL CABLE SERVICE

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1 INTRODUCTION

Now, for the first time there will be an *economically viable* method for cable system operators to provide their subscribers with a truly "subscriber friendly" signal security system, while avoiding costly set-top churn losses. Multichannel Communication Sciences, Inc. ("MCSI") a small high technology company in San Diego, California, has developed a proprietary digital technology, called Digital Broadband Descrambling ("DBD"), for simultaneous on-channel descrambling of a large number of TV signals, that at the same time leaves other channels unaltered and performs on-channel denial processing on still other unauthorized channels to securely deny those signals.

Unlike existing "one-channel-at-a-time" descrambling technologies, MCSI's DBD technology provides all authorized channels in the clear and thus will enable subscribers to enjoy their cable ready TVs and VCRs in a whole-house service. Hence, the subscribers would make full use of all the features they purchased in their consumer electronics equipment, including built-in VCR programming functions, remote controls, watching and recording from two different scrambled channels simultaneously or consecutively, and viewing multiple channels at once (picture-in-picture). All this is accomplished in a manner that is compatible with today's sync suppression scrambling formats, allowing MSO's who operate scrambled addressable systems to migrate to DBD technology in an economically graceful manner over a period of time of their choosing. Cable operators would realize substantial operation savings due to Pay services subscription lift, substantial reductions in service calls associated with home wiring, TV tuning and set-top descrambler churn. Furthermore, the DBD devices will pass into the home all other unprocessed channels including digital compression signals thereby allowing compatibility with future digital transmission. Figure 1 depicts a comparison of the typical interconnection required for conventional set-top descramblers versus MCSI's broadband multichannel descramblers. Figure 2(b) depicts the simultaneous broadband clear channel availability as compared with Figure 2(a) for a conventional single channel decoder.

While providing service to subscribers in a manner that is fully responsive to the recently enacted Cable Law, MCSI's technology will not only provide operator savings, but also introduce a strong service differentiation over competitive Telco or DBS video providers who will be unable to provide consumer-interface-friendly, "set-top-less" broadband service to the home. It should be emphasized that in the regulatory environments following the '92 Cable Law, in which Cable's programming exclusivity may no longer survive, Cable's intrinsic broadband simultaneous signal offering shall remain the only *sustainable* differentiating feature over other multichannel video competitors.

2 BROADBAND DESCRAMBLING TECHNOLOGY

MCSI has developed and demonstrated a proprietary technology for controlling the simultaneous access and descrambling of many scrambled TV channels on a CATV system. This technology enables a CATV system operator to eliminate the need for any set-top descramblers in subscribers homes and thus facilitates the subscriber's use of all cable ready features purchased with today's television receivers and VCR's, including additional TV outlet service for all authorized channels. All this is done while preserving a scrambled signal distribution on the cable plant on the one hand, and by supplying a broadband signal to the home in which all authorized channels are simultaneously descrambled and provided in the clear at every TV outlet in the home.

Because the MCSI technology is based on digital broadband RF signal processing techniques, it can simultaneously descramble a number of channels, while at the same time process other selected channels to further deny clear access. While this processing is being done, all other unprocessed channels carried on the cable system are passed through to the subscriber unaltered by the DBD hardware. The final result is that the entire spectrum of channels is made available to the subscriber, with authorized channels descrambled, and the unauthorized channels passed through in their original scrambled form, or even further processed in the MCSI subscriber unit to affect further denial beyond normal scrambling, i.e., provide additional security. This additional denial feature also provides the operator the ability to deny otherwise clear signals in an expanded basic tier without the need to scramble those signals at the headend, and without the need to provide the majority of subscribers with a descrambler.

Recently, the Company began to demonstrate in its San Diego facility an engineering feasibility prototype system to cable system operators. This limited implementation of MCSI's technology demonstrates simultaneous descrambling of any subset of a large group of channels, while passing all other channels unaltered. In addition, the prototypes demonstrates the effectiveness of various alternative modes of enhanced security, and an addressable on-screen textual display.

2.1 Compatibility with Existing Scrambling Systems

The MCSI descrambling technology can be implemented to descramble either the baseband sync suppressed scrambled signals such as those used in Zenith's Z-TAC systems, or the RF sync suppression scrambling method used by Jerrold, Scientific Atlanta, Pioneer and others. This allows for a cost effective backward compatible phased migration, perhaps over a number of years, from today's single channel set-top descramblers to multichannel broadband descramblers that may be installed on the pole, pedestal or the side of the subscriber's home or any other internal point of entry. Thus, an economically graceful migration from today's subscriber configurations as shown in Figure 1(a) to configurations shown in Figur 1(b) can be

accomplished with all the resultant benefits discussed below.

Because of its compatibility and ability to coexist with today's set-top converter/descramblers, MCSI technology can be implemented initially without changes to the existing headend addressable scramblers, controllers or their software. Thus, without the need of cable system upgrades, the MCSI approach will offer operators a much more attractive alternative for subscriber friendly access control systems than such cost intensive systems as Interdiction, or inflexible approaches as addressable traps being offered by some vendors.

Unlike set-top descramblers used today, the MCSI broadband descramblers introduce virtually no artifacts or distortion in either the audio or video signals on descrambled and non-blocked channels. Therefore, video and audio quality is significantly improved with respect to current set-top devices, and functions such as MTS stereo are fully retained without loss of performance associated with today's set-top descrambler degradations.

2.2 Transition to Proprietary Enhanced Scrambling

The MCSI system will offer cable system operators the ability to migrate to a new enhanced security multichannel video scrambling method developed by MCSI. This proprietary headend-originated security scheme will provide the enhanced security needed for pay-per-view and pay services for which current scrambling methods have been compromised by pirate decoders. Migration to MCSI's new enhanced security system may be accomplished on a channel by channel basis beginning with any channel for which all authorized subscribers are served by an installed MCSI access control device. This headend originated scrambling method will allow early and economic migration to the enhanced security mode in lower penetration, but high revenue producing, pay services.

2.3 Number of Processed Channels

MCSI employs a proprietary wide band digital spectral processing system which provides for separate and independent signal processing functions in each 6 MHz CATV channel within preselected channel groups. Because the Company's signal processing functions can be implemented over the entire CATV channel range, the incremental cost of increasing the number of controlled channels is quite low. When the MCSI technology is implemented in a limited number of custom VLSI chips the number of individually controlled channels can economically reach 72 or more.

MCSI's first product will provide for 36 channel processing capability, with pass-through transparency for all other non-processed channels up to 550 MHz or 750 MHz. Through the use of a plug-in expansion module, an additional 36 channels can be processed, providing a total of 72 individually and simultaneously controlled channels. The MCSI subscriber device operates on remotely configureable groups of individually controlled contiguous channels, and does not disturb signals on other (unprocessed) channels. The MCSI hardware design is compatible with digital transmission and also allows for future compressed NTSC or HDTV signals.

2.4 Additional Tiering Security by Signal Denial Processing

The MCSI subscriber devices can accomplish further video and/or audio denial of unauthorized channels, thereby providing additional security in subscriber locations in which they are installed. This approach instantly renders obsolete existing "pirate boxes" operating on scrambled channels. This feature may be used to deny access not only to head-end originated scrambled channels, but also to clear channels that may be a part of an expanded basic tier that has high penetration. In this way, DBD devices can be installed initially only in subscriber locations which require the pay scrambled tiers or only the bare basic tier, thereby providing denial of the expanded basic clear channels and providing access control to higher pay tiers without buy-through constraints. An example of such arrangement is shown in Figure 3. Thus, cost effective tiering can be accomplished without scrambling any of the basic channels. It becomes clear that DBD devices **simultaneously** provide positive security on some channels and negative security on other channels, as configured by addressable control from the headend.

In addition to addressable channel tiering capability, each subscriber module is equipped with an addressable control enabling connect/disconnect capability. This feature allows for the elimination of truck rolls for service disconnects and reconnects.

2.5 On Screen Display Capability

Another feature of the MCSI system is an optional provision for On-Screen Display (OSD) text insertion capability within the subscriber module that can be individually controlled on an addressable basis from the headend. This addressable OSD option can be used for downloadable addressable textual messages inserted on selected channels for billing or disconnect messages, or diagnostic applications.

2.6 Projected Cost

The MCSI system makes use of certain digital signal processing chips that have recently been developed for personal computers and digital cellular telephony. Thus, tremendous cost and time advantages can be gained, since these complex chips are already developed and are in high volume production and readily available at low cost.

MCSI's products are projected to be priced at an average of \$140 per addressable subscriber - roughly the amount a cable operator now invests on an addressable subscriber (1.3 sets/sub). Cost reductions achieved through economies of scale inherent in larger volume production, and learning curve experience, will enable the costs of DBD devices per addressable subscriber to be even less than today's single channel descrambling technology.

2.7 Product Configurations

Two product configurations have been considered. The first device is a Single Family dwelling Unit (SFU) that is mounted on the side of the home and powered from the subscriber

premises. The second configuration is designed to serve subscribers in Multiple Dwelling Unit (MDU) housing including apartments, condominiums, and mobile home parks, as well as pole and pedestal mounts for which multiple DBD subscriber devices can share a common enclosure. The advantages of providing an MDU product configuration are derived from the lower electronics and installation costs per subscriber due to the sharing of electronics and the secure enclosure.

The systems designed for Baseband Sync suppression compatibility and those designed for RF Sync suppression compatibility are designed such that when configured for MCSI's enhanced scrambling, their operation is identical and they may coexist on one cable system utilizing the MCSI enhanced scrambling mode.

2.8 Pay-per-view (PPV) and IPPV

Because the first version of MCSI's subscriber units would be compatible with existing scrambling systems, they can be addressed through the exiting ANI an ARU IPPV system, thereby offering these capabilities to subscribers equipped with DBD devices. Similarly, cable system employing CSR's for reservation PPV will be able to address the DBD units as usual.